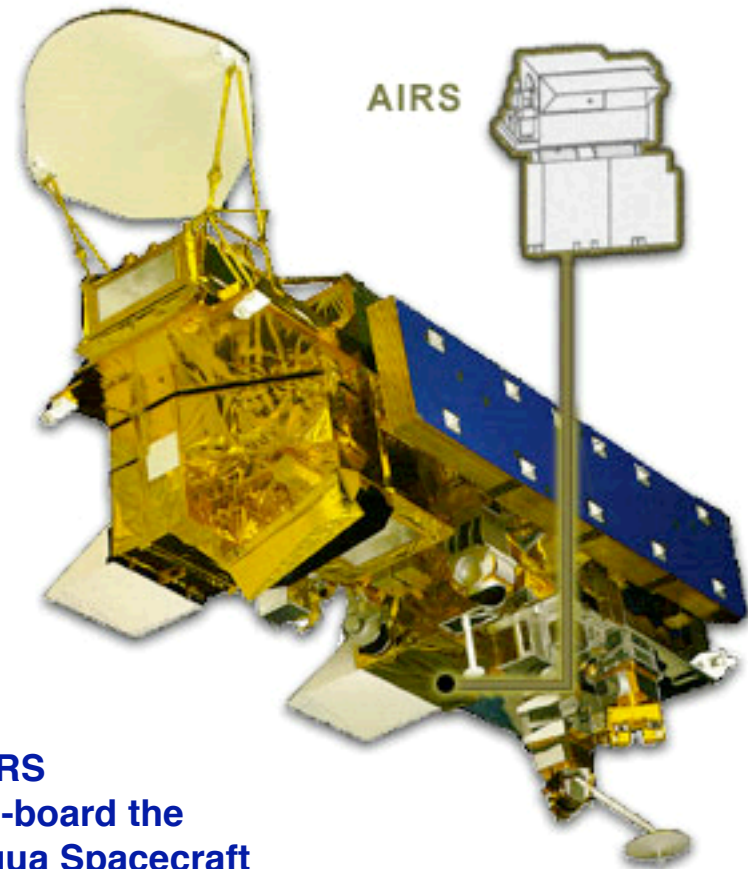




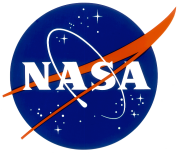
AIRS PROJECT OVERVIEW AND LAUNCH READINESS STATUS

13 February 2002

**Tom Pagano
AIRS Deputy Project Manager**



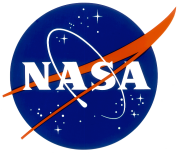
**AIRS
on-board the
Aqua Spacecraft**



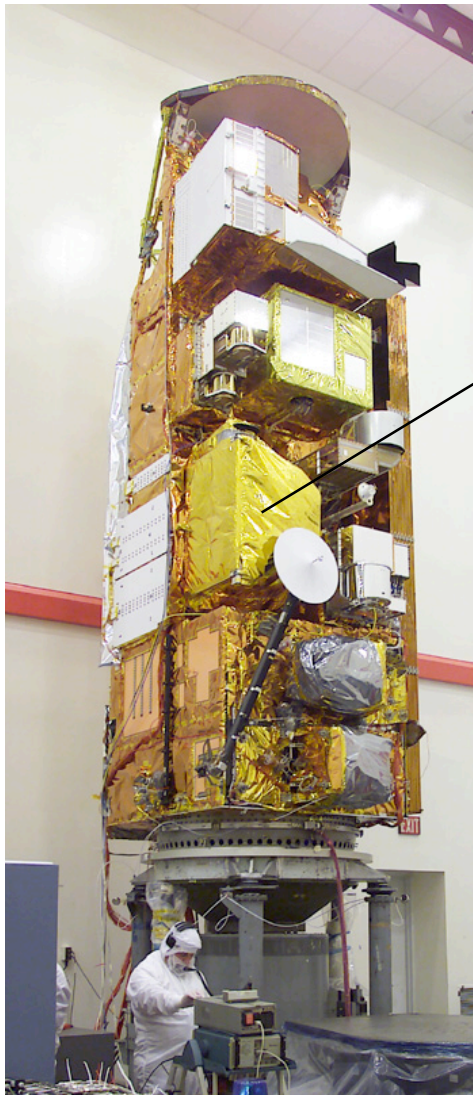
AIRS PROJECT PARTICIPATION



- **AIRS is the Atmospheric Infrared Sounder**
- **Sponsored by NASA Office of Earth Science**
- **Managed by JPL, NASA, California Institute of Technology**
- **Instrument built by BAE Systems in Lexington Ma.**
- **Science Participants include**
 - *NASA JPL, GSFC, LaRC*
 - *NOAA/NESDIS*
 - *MIT/LL*
 - *ECMWF*
 - *UMBC, UW/SSEC, UCSB*
 - *and many others*

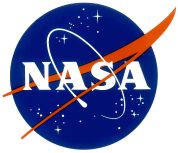


AQUA SPACECRAFT NEARLY READY FOR SHIP TO WTR



AIRS
ON
AQUA
S/C

- AIRS will fly on the Earth Observing System (EOS) “Aqua” spacecraft
- Aqua to be launched from Vandenberg April 18, 2002
- Status
 - *PSR February 5-6, 2002*
 - *Ship to WTR Feb 22, 2002*
- Orbit: 705 km, polar sun synchronous, ascending 1:30 PM ect
- Companion instruments
 - **AMSR-E**
 - **AMSU-A** (*Advanced Microwave Sounding Unit - A*)
 - **HSB** (*Humidity Sounder for Brazil*)
 - **CERES**
 - **MODIS**



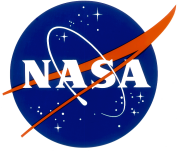
AIRS IS READY FOR LAUNCH



- Two thermal vacuum cycles at BAE Systems
- Delivered to Spacecraft in November 1999
 - Environmental Testing
 - Comprehensive Functional and Performance Testing
 - All command sequences and databases demonstrated end-to-end
- AIRS Launch Readiness Review
 - Jan. 29, 2002
 - Independent Review Board
- No Liens on AIRS Hardware
 - All P/FRs resolved

AIRS Requirements

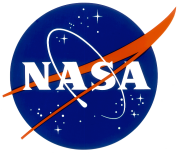
- Instantaneous Field of View : $1.1^\circ \times 0.6^\circ$ (13.5 km x 7.4 km)
- Scan Range: $\pm 49.5^\circ$
- IR Spectral Range: 3.74-4.61 μm , 6.2-8.22 μm , 8.8-15.4 μm
- IR Spectral Resolution: ≈ 1200 (\square/\square)
- Number of IR Channels: 2378 IR
- VIS Channels: 4 (0.41-0.44 μm , 0.58-0.68 μm , 0.71-0.92 μm , 0.49-0.94 μm)
- VIS Spatial Resolution: 0.14° (1.7 km)
- Mass: 177Kg, Power: 256 Watts, Life: 5 years (7 years goal)



POST-LAUNCH OPERATIONS READY FOR LAUNCH



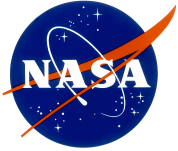
- **AIRS operations manual complete**
- **In-Flight operational timeline developed**
- **All procedures and databases complete**
 - *SCIF 4 Run for Record Scheduled 2/7/02*
- **Critical operations constraints and rules defined**
- **Anomaly investigation plan in place**
- **Operation teams defined: AIRS, AMSU, HSB**
- **Tested every command and every procedure we anticipate using in orbit. No Liens.**



AIRS CALIBRATION READY



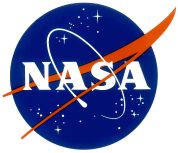
- Radiometric linearity and OBC BB calibration completed with accuracies less than $\pm 0.2\text{K}$ at 265K for all channels
- Spectral accuracies better than 1% $\Delta\lambda$
- Channel spectra in-flight characterization approach verified
- All in-flight special calibration sequences (SCS) (11) demonstrated at TRW
- L1B calibrated radiances algorithms and software in final verification
- Long term calibration and high rate telemetry trending software in place



SCIENCE DATA PROCESSING SYSTEM READY FOR LAUNCH



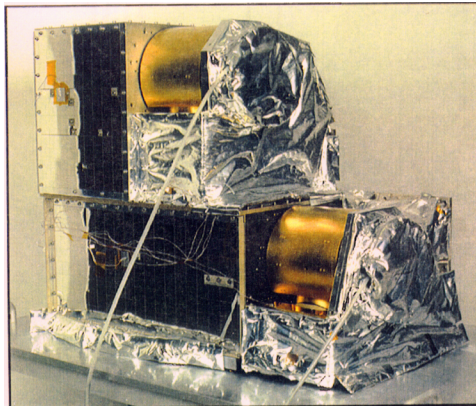
- **Launch-ready SPS software has been delivered to GSFC DAAC**
- **Data from TRW warm test and TVAC tests Processed at JPL TDS with no major problems**
- **Launch-ready PGEs most recently tested during MOSS 6 testing at JPL TDS and GSFC DAAC**
- **Operational Loading Test in TDS underway**
- **A schedule exists for post-launch delivery of production level code to the GSFC DAAC**



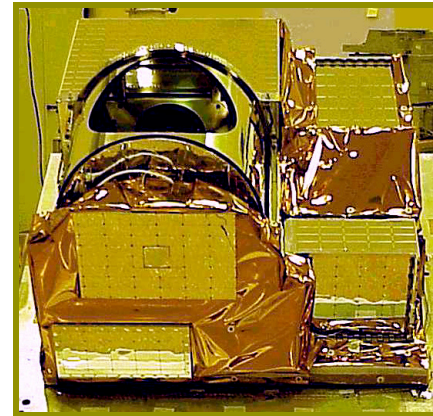
AMSU/HSB SUITE READY FOR LAUNCH



AMSU-A1



HSB



AMSU-A2



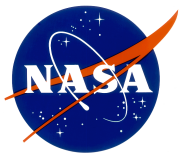
- **Instruments Ready**
 - *No Hardware Liens Per Aerojet and INPE*
 - *Calibration Complete*
- **Science Data Processing System Ready**
 - *Demonstrated using sim and T/V data*
- **QA Post Processing and Analysis Launch Ready**



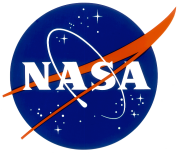
CONCLUSIONS



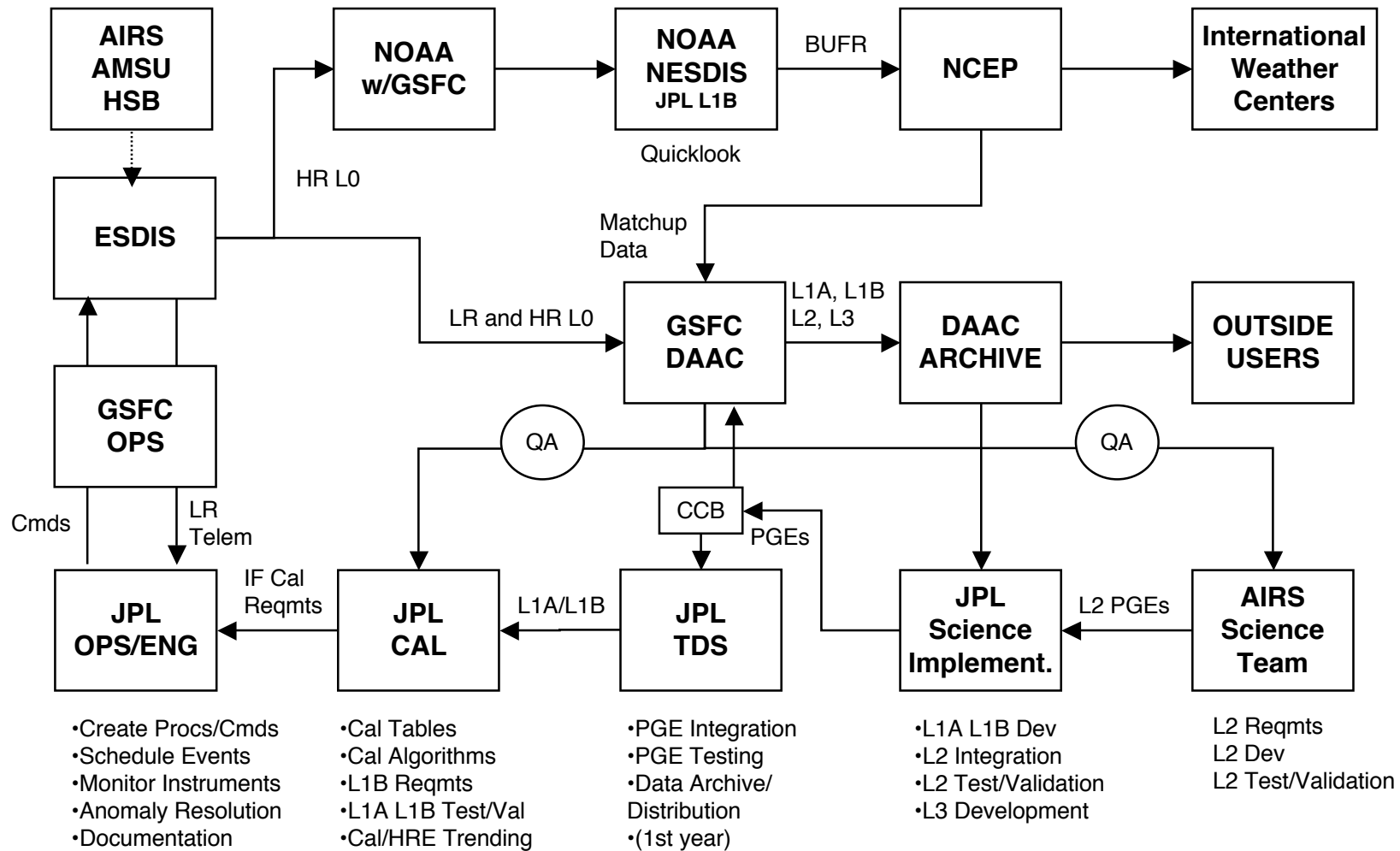
- **AIRS Experiment ready for Launch**
 - *Instrument functioning extremely well; no hardware liens.*
 - *Instrument well characterized from pre-launch TVAC testing*
 - *Passed all Environmental Tests*
 - *Performed Flawlessly in Thermal Vacuum at TRW*
 - *Exceptional performance and sensitivity in flight like environment; no influence from the spacecraft (WYSIWYG)*
 - *Operations procedures developed and fully tested to safely activate and operate the instruments*
 - *Science Data Processing System has been delivered to GSFC DAAC and flow testing has been demonstrated.*
- **Acknowledgements**
- For more information see www-airs.jpl.nasa.gov

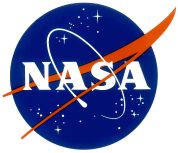


BACKUP



AIRS/AMSU/HSB DATA FLOW





AIRS TECHNOLOGY



- **IR Spectrometer: Multi-Aperture Array Grating Spectrometer**
- **Spectrometer Cooling to 155K with Two-Stage Passive Radiator**
- **Focal Plane Cooling using Single Stage Stirling Pulse Tube, Redundant**
- **FPAs: PV HgCdTe to 13.7 μm , PC HgCdTe to 15.4 μm**
- **On-Board Calibration Views: Space, Blackbody, Parylene (Spectral), 3 VIS/NIR Lamps**
- **Electronics Architecture:**
 - *Dual Redundant/ μ -processor controlled*
 - *On-board radiation circumvention signal processing*

